low Energy COnsumption NETworks

DELIVERABLE D7.5

SECOND ECONET INFORMATION DISSEMINATION PLAN

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1. Executive summary

This document contains the second year update of the dissemination plan for the ECONET project. The plan aims at promoting scientific and technical progress in low energy consumption networks related research, communicating project results to the widest possible audience, supporting the implementation of project results and fostering their impact on the European society.

Dissemination activities follow the ECONET communication strategy and implement actions raising the awareness and maximizing the adequate exploitation of project results, communicating the vision and the goals of the ECONET project and promoting a novel standard for green networking. Specifically, the dissemination strategy of ECONET includes:

- liaison with related research initiatives and expert working groups,

- contacts with standardisation bodies,

- cooperation with other RTD initiatives,

- creation and maintenance of a public website,

- media relations (press conferences, press releases at appropriate time-points),

- scientific publications in leading scientific journals,

- talks and lectures at national and international conferences,

- seminars targeting interested companies, academic groups and/or stakeholders,

- dialogue with policy makers, stakeholders, citizen's associations, to demonstrate benefits for the industry and community.

The purpose of this document is to give the description of the activities in 2010-2012 concerned with transfer of knowledge about ECONET project results and technologies to the public, stakeholders, potential users, experts from industry and research, and the second overview of the dissemination roadmap. Some of the information included may be modified in the course of the project development due to the natural progress of the research. When the concepts have been proven to be stable and realizable the dissemination and training events will be extended to focus on more practical information related to the active exploitation.

2. Dissemination activities

2.1. Liaisons with related research activities and expert working groups

The ECONET partners have activated cooperation initiatives with the following projects, organizations and communities:

- "Energy-Aware Radio and neTwork technologies – EARTH" project, funded by the European Commission (EC), linked by the ECONET partners ALU and TELIT[*].

- "Green Touch" initiative by Bell Labs of Alcatel-Lucent, linked by the ECONET partner ALU. The cooperation has been exploited by informing and updating the GT group about ECONET and its topics and results with specific presentations and seminars (see par. 2.7.1)

- "ICT for Energy Efficiency – ICT4EE" forum, linked by the ECONET partner TELIT.

- Future InterNet Energy Efficiency (FINE 2), project funded my the Italian Ministry for supporting collaborations with USA research entities and realized by CNIT with the Portland State University and the University of South Florida.

- Portland State University (PSU) as collaborating institution has concretized the relationship with contributions inserted in common publications with the consortium (see the list of publications), a visiting period of Prof. Suresh Singh and one of his PhD student, and a period at PSU of a Genoa/CNIT PhD student (see par. 2.7.1).

- "Towards Real Energy-efficient Network Design – TREND" Network of Excellence (NoE), funded by the EC, linked by the ECONET partner CNIT. The cooperation has been exploited by the common effort in events such as cross participation and presentations at internal meetings of both projects, and in common events organized by one of the partners (see par. 2.7.1).

- "Cognitive radio and Cooperative strategies for POWER saving in multi-standard wireless devices – C2POWER" project, funded by the EC, linked by the ECONET partner LQDE. The cooperation has been exploited by the common participation in events (see par. 2.7.1).

- Generalised Architecture for Dynamic Infrastructure Services – GEYSER, linked by the ECONET partners TELIT and CNIT.

- Scalable, Tuneable and Resilient Optical Networks Guaranteeing Extremely-high Speed Transport – STRONGEST, linked by the ECONET partner ALU. The cooperation has been exploited by the common participation in events (see par. 2.7.1).

- "The green GÉANT team – GN3 project", co-funded by European National Research & Education Networks (NRENs) and the EC, linked by the ECONET partner GRNET. GRNET is disseminating ECONET work within the team and also takes the responsibility of the liaison between the two projects.

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[*] Up to the conclusion of this project, i.e. June 2012.

- "ECONHOME" project, French national funded initiative contacted by TELIT and LQDE through HGI and Sagemcomm members. The collaboration has been exploited by a some discussion and a remote common meeting (see par 2.7.1).

- NetFPGA Community to promote ECONET activity on NetFPGA in the research community, by means of a liaison managed by LTH and DCU.

- Future Internet Cluster; the ECONET project has participated in the initiative of these EU clustering activities by contributing to organized events with presentations and proposals (see par 2.7.1).

- IEA (International Energy Agency), an autonomous organisation that works to ensure reliable, affordable and clean energy for its 28 member countries and beyond. The IEA's four main areas of focus are: energy security, economic development, environmental awareness, and engagement worldwide. It has been contacted by TELIT and CNIT and some preliminary discussions have been done for future collaborations.

- Strict relationships with ITU-T, ETSI, HGI, JVRS, EU-JRC entities has been also created; however, these institutions being standardization bodies the ECONET liaisons with them have been specifically reported in the deliverable D7.6.

For each of these projects/initiatives one or more partners take the responsibility of the liaison throughout the project duration.

The cooperation with such initiatives, forums and RTD project aims at:

- exchanging and comparing perspectives on next-generation energy-efficient networks, technical knowledge and results and main achievements,

- creating synergies for impacting on standardization bodies in an as much as possible effective way ,

- participating in forum activities (e.g., ICT4EE) in order to create consensus and common visions and make the impact on standardization easier,

- creating inter-workable energy-efficient solutions, protocols and technologies for future networks (e.g., between ECONET wired solutions and EARTH wireless ones),

- organizing and/or participating in common events, workshops and open panels/discussions in order to maximize the impact and the soundness of EC efforts in the field of energy-efficient Information and Communication Technology (ICT).

- Identifying potential synergies for enhancing the impact on standardization bodies in an as much as possible effective way

2.1.1. Future plan

For what concerns the future plan, it is to focalize most of the effort in this respect to a more reduced group of entities. The main entities addressed are the standardization bodies, the IEA (which seems to be a good means for involving the political and management levels of public and private organizations in the process), few still active projects (most of the above cited ones are finishing during 2012; namely, C2Power, EARTH, GEYSER, STRONGEST) like TREND and ECONHOME, and finally the NetFPGA Community and the Green Touch initiative.

2.2. The website

Internet websites represent one of the primary media for the dissemination of project activities. The Internet domain "**www.econet-project.eu**" is active since the start of the project.

The ECONET website is intended to be used for both internal consortium communication and public dissemination; it is an effective communication channel where information and knowledge produced by the project can be shared among partners and/or published to be available for the general public.

For external dissemination, publicly accessible website sections have been set up. Through these sections, the general public can access the common information about the project, i.e.:

- contact data of the coordinator,

- the list of the partners with links to their own websites,

- a short description of the project underlining the objectives and key ideas, etc.,

- the introductory dissemination material, such as the ECONET leaflet, written in an appropriate language and style.

Moreover, results and outcomes of the project, as well as all the publications of the project, are and will be made available (subject to copyright and IPR conditions). The list of publications contains:

- papers in scientific journals,

- book chapters,

- papers in scientific conference, symposia and workshop proceedings.

The list of dissemination actions contains:

- attended conferences, symposia, workshops and exhibitions,

- panel discussions and invited speeches,

- attended seminars, meetings and other dissemination events,

- tutorials and lectures.

The website is also heavily used for internal communication: project resources like minutes of meetings, deliverable templates, presentations, scientific papers or general guidelines are published on the repository area, only viewable by consortium members. Moreover, officially released deliverables are at disposal of the Project Officer and the Project Reviewers through the private section of the website. Beside possible refinements of the site and the update of the stored data, no changes are planned in this respect.

2.3. *Dissemination materials*

2.3.1. Leaflet

A project leaflet (English and Italian versions) was prepared and distributed. It contains:

- basic information about the ECONET project,

- the contact data of the coordinator,

- the list of all the partners of the consortium.

This leaflet informs on the purpose of the project. The main goal is to make the reader - regardless of he/she being a scientist, an expert in the field, a student or just a citizen - aware of the project, of the emerging green networking technologies and of the advantages that could be offered by the energy efficiency solutions applied to the network in a comprehensive way.

This leaflet has been already distributed and will be distributed during the project lifetime at conferences, workshops, seminars and events, etc. An electronic version of the leaflet has been uploaded to the project website. Hence, it is at disposal to be downloaded by any interested users.

2.3.2. Brochure

The ECONET brochure, originally planned for the second year of the project, has been deferred to the beginning of the third year, when project results will better finalized to be disseminated more effectively. The brochure will aim to illustrate the most promising and/or interesting expected outcomes of ECONET research activities.

This brochure will be about 4 pages in length and it should be understandable even for people who are not familiar with the green networking topic. It will contain information on the advantages of the solutions proposed and/or provided by the ECONET project together with a simple explanation of the respective technologies.

The brochure will be distributed during the project lifetime at selected conferences, workshops or seminars, where it will appear to be more appropriate than the simple leaflet. An electronic version of the brochure will be uploaded on the project website so as to be at disposal to be downloaded by any interested user.

2.3.3. Posters

An A0-format poster was prepared during the first year to be used at various events where the ECONET consortium will be present. During the second year a few additional posters have been prepared.

The first one contains the ECONET general information and depicts the overall idea of the project, with the main purpose to arouse curiosity and induce persons to ask more information. The poster in itself is generic, so that all dissemination targets could be addressed: it is mainly used as an instrument to stimulate live discussions and to help in disseminating ECONET vision and/or outcomes letting the speaker to tune the level of details as appropriate.

The other ones, developed during the second year, are updated versions of the original poster with new additional information about the project (i.e., current status in terms of specific technical adopted solutions, preliminary results,…) or they are specifically focused on one of the main aspects studied in the project itself (e.g., Green Abstraction Layer, Network Connectivity Proxy). Depending on the context and on the specific goal, a different mix of these posters has been (and will be) used (e.g., during the ETSI Workshop, where one of the main goals was to promote the

standardization of the GAL, two posters were exposed, one general and the other focused on the GAL).

2.3.4. Banner

The consortium realized a banner (i.e., large stripe), which will contain the project website address and the ECONET logo together with the logos of all the partners, in order to increase the visibility of the project during the participation at workshops, conferences or other dissemination events that provide assigned spaces to participants, such as desks or booths.

2.3.5. Video

The ECONET consortium will envisage the opportunity to produce promotional videos in case they can improve the descriptive impact of the vision and the key ideas of the project or help wider communication and deeper explanation of proposed/developed solutions within the ECONET activities.

Two short videos presenting the concept of energy-efficient traffic engineering and preliminary results of research on novel distributed control strategies, which allow reducing the total power consumption in the network, while guaranteeing network service requirements, have already been prepared (see Fig. 1). These videos were presented at conferences and exhibitions. They have been uploaded on the project website. Hence, they are at disposal to be downloaded by any interested users.
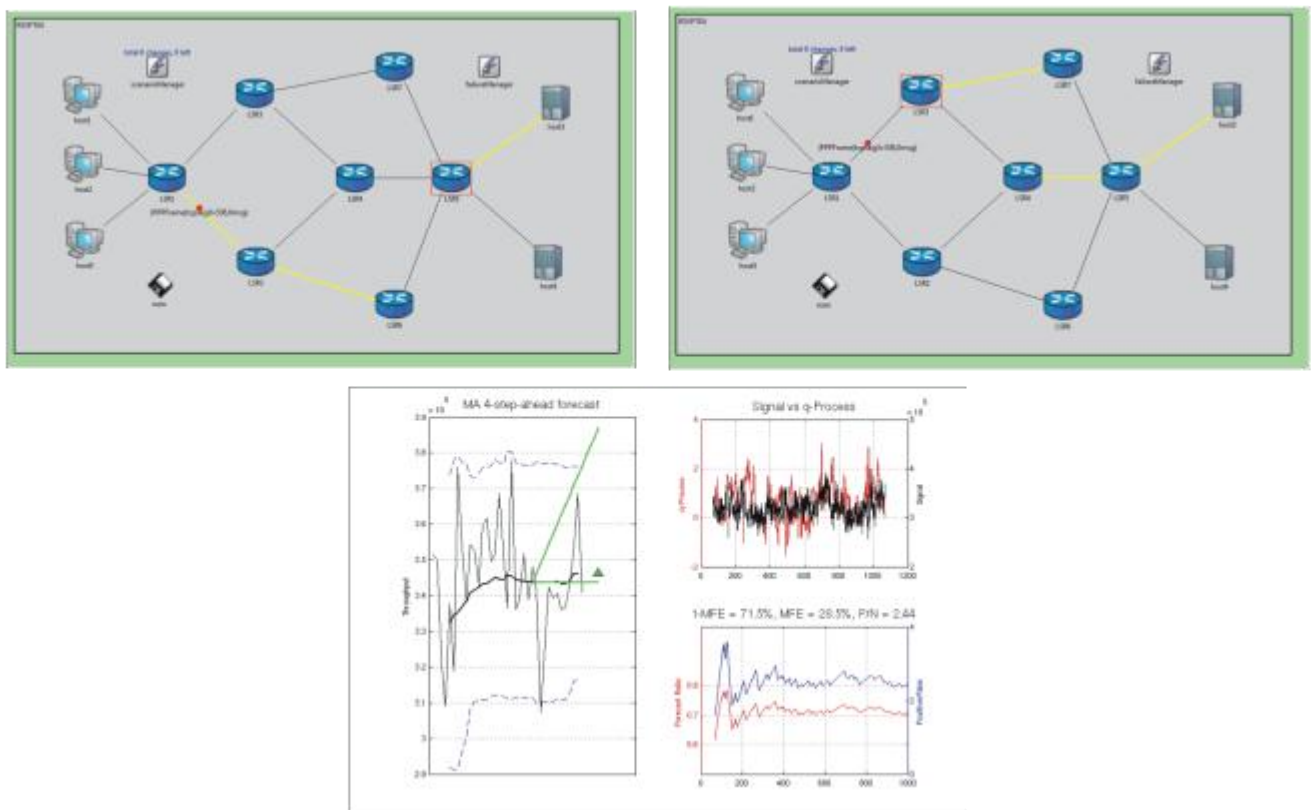

Figure 1: Videos presenting green strategies at the control plane.

2.3.6. Future plan for the dissemination material

The leaflets will be updated by mid third year to reflect the status of the project and to include some of the obtained results. The same process will be applied with respect to the main poster of the project, while other posters will be produced for supporting participations in future events, especially for what concerns the planned exhibitions (see the specific section), where to present the objects developed in the projects. Some videos about the different demos and possibly one on the final demonstration will be realized in the third year.

2.4. Scientific publications

The members of the consortium have strong commitment in publishing their work in relation to the ECONET themes and research topics in both national and international high quality journals and books. Technical documents, such as whitepapers, research reports, specifications or contributions to standards, are also a valuable dissemination channel of the project outcomes (either towards the external world or, at least, within the consortium partners, should the IPR rules not allow to disclose some of such technical documents outside the project). In this respect, it is also worth noting that all the public deliverables of the project are and will be publicly available through the repository of the ECONET website.

The list of targeted journals is presented below:

- ACM SIGCOMM Computer Communication Review
- Communications & Strategies Journal
- Computer Networks Journal
- International Journal of Network Management
- International Journal of Future Generation Communication and Networking
- IEEE Transactions on Network and Service Management
- IEEE/ACM Transactions on Networking
- IEEE Communications Magazine
- IEEE Network Magazine
- IEEE Communications Surveys and Tutorials
- Infocommunications Journal
- Journal of Network and Systems Management
- Telecommunications Policy Journal
- Journal of Telecommunications and Information Technology
- International Journal of Applied Mathematics and Computer Science
- Concurrency and Computation: Practice and Experience
- Computer Communications Journal
- International Journal of Space-Based and Situated Computing
- International Journal of Communication Systems

- Simulation: Transactions of The Society for Modeling and Simulation International

- Telecommunication Review – Telecommunication News
  (Przegląd Telekomunikacyjny – Wiadomości Telekomunikacyjne)

The list of all papers and documents that have already been and will be produced by ECONET partners are and will be inserted and regularly updated in the scheduled "ECONET information dissemination plan". The scientific publications in journals (9 articles), book contributions (5 chapters) and conference proceedings (26 papers) that have already been published by the partners are shown in Tables 1 and 2, respectively.

Table 1: Scientific publications (journals and book chapters).

Authors	Title of the publication	Journal or Book	Reference details
R. Bolla, F. Davoli, R. Bruschi, K. Christensen, F. Cucchietti, S. Singh	*The Potential Impact of Green Technologies in Next-Generation Wireline Networks: Is There Room for Energy Saving Optimization?*	IEEE Communications Magazine - Feature Topic on Energy Efficiency in Communications	Vol. 49, No. 8, pp. 80-86, 2011
R. Bolla, R. Bruschi, F. Davoli, F. Cucchietti	*Energy Efficiency in the Future Internet: A Survey of Existing Approaches and Trends in Energy-Aware Fixed Network Infrastructures*	IEEE Communications Surveys and Tutorials	Vol. 13, No. 2, pp. 223-244, 2011
R. Bolla, R. Bruschi, A. Cianfrani, M. Listanti	*Enabling Backbone Networks to Sleep*	IEEE Network Magazine (Special Issue on "Energy-Efficient Networks")	Vol. 25, No. 2, pp. 26-31, 2011
A. Lombardo, D. Reforgiato, V. Riccobene, G. Schembra	*NetFPGA Hardware Modules for Input, Output and EWMA Bit-Rate Computation*	International Journal of Future Generation Communication and Networking	Vol. 5, No. 2, pp. 121-136, 2012
A. P. Bianzino, L. Chiaraviglio, M. Mellia, J.-L. Rougier	*GRiDA: Green Distributed Algorithm for Energy-Efficient IP Backbone Networks*	Computer Networks, Elsevier	Vol. 56, No. 14, pp. 3219-3232, 2012

Authors	Title of the publication	Journal or Book	Reference details
M.Kamola, P. Arabas, P. Jaskóła, A. Sikora, E. Niewiadomska-Szynkiewicz, K. Malinowski, M. Marks, M. Mincer, K. Daniluk	*Econet - Energy Efficient Technologies for Wired Networks* "Econet – energooszczędne technologie dla przewodowych sieci komputerowych" (in Polish)	Telecommunication Review – Telecommunication News	Vol. 3, pp. 1-7, 2012
R. Bolla, R. Bruschi, A. Carrega, F. Davoli, D. Suino, C. Vassilakis, A. Zafeiropoulos	*Cutting the Energy Bills of Internet Service Providers and Telecoms Through Power Management: An Impact Analysis*	Computer Networks, Elsevier	Vol. 56, No. 10, pp. 2320-2342, 2012
J. Huang, O. Ormond, D. Ma, X. Wang	*Optimizing energy-efficiency for program partitioning and mapping onto multi-core packet processing systems*	Journal of China Universities of Posts and Telecommunications	Vol. 19, No. 1, pp. 79-86, 2012
F. Guo, O. Ormond, L. Fialho, M. Collier, X. Wang	*Power consumption ayalysis of a NetFPGA based router*	Journal of China Universities of Posts and Telecommunications	Vol. 19, No. 1, pp. 94-99, 2012
R. Bolla, R. Bruschi, F. Davoli, P. Lago	*Trading off Energy and Forwarding Performance in Next-Generation Network Devices*	Green Communications: Theoretical Fundamentals, Algorithms and Applications, Chapter 24, J. Wu, S. Rangan, and H. Zhang Eds.	CRC Press, Taylor & Francis, pp. 693-716, 2012
R. Bolla, R. Bruschi, A. Lombardo	*Standard Methodologies for Energy Efficiency Assessment*	Green Communications: Theoretical Fundamentals, Algorithms and Applications, Chapter 24, J. Wu, S. Rangan, and H. Zhang Eds.	CRC Press, Taylor & Francis, pp. 83-101, 2012

Authors	Title of the publication	Journal or Book	Reference details
C. Hu, B. Liu, M. Zhang, B. Zhang, X. Wang	*Architectural Design of An Energy-efficient Router*	Green Communications and Networking, F. R. Yu, X. Zhang and V. C. M. Leung Eds.	CRC Press, Taylor & Francis, 2012
E. Niewiadomska-Szynkiewicz, A. Sikora, P. Arabas, J. Kołodziej	*Control System for Reducing Energy Consumption in Backbone Computer Network*	Concurrency and Computation: Practice and Experience (CCPE), John Wiley & Sons, Ltd	2012
K. Daniluk	*Energy-Efficient Protocols in OMNeT++ Simulation Environment*	International Book Series Information Science and Computing	2012 (to appear)

Table 2: Scientific publications (conference proceedings).

Authors	Title of the publication	Proceedings of	Year
R. Bolla, R. Bruschi, A. Carrega, F. Davoli	*An Analytical Model for Designing and Controlling New-Generation Green Devices*	IEEE Globecom 2010, 3rd Int. Workshop on Green Communications (GreenCom'10), pp. 1388-1393 [Best Paper Award]	2010
R. Bolla, R. Bruschi, A. Carrega, F. Davoli	*Theoretical and technological limitations of power scaling in network devices*	Australasian Telecommunication Networks and Applications Conf. 2010 (ATNAC 2010), Auckland, New Zealand, Nov. 2010, pp. 37-42.	2010
R. Bolla, R. Bruschi, C. Lombardo, D. Suino	*Evaluating the Energy-Awareness of Future Internet Devices*	12th IEEE Conference on High Performance Switching and Routing (HPSR'11), pp. 36-43.	2011

Authors	Title of the publication	Proceedings of	Year
A. Lombardo, C. Panarello, D. Reforgiato, E. Santagati, G. Schembra	*A Flexible Router for On-Fly Dynamic Packet Management in NetFPGA Platform*	GTTI (Italian Association of Telecommunications and Information Technologies Group), Proc. on line.	2011
R. Bolla, R. Bruschi	*Energy-Aware Load Balancing for Parallel Packet Processing Engines*	1st IEEE Online Green Communications Conference (GreenCom'11), pp. 105-112.	2011
R. Bolla, R. Bruschi, C. Lombardo	*State of the Art of Existing Standards for the Evaluation of Network Performance and Energy Consumption*	SCS International Symposium on Performance Evaluation of Computer and Telecommunication Systems (SPECTS'11), pp. 62-68.	2011
R. Bolla, R. Bruschi, A. Cianfrani, M. Listanti, O. Jaramillo	*Energy-Efficient Sleeping Modes for Next-Generation Core Networks*	Future Network & Mobile Summit 2011, pp. 111-118.	2011
R. Bolla, R. Bruschi, A. Carrega, F. Davoli	*Green Network Technologies and the art of Trading-off*	IEEE INFOCOM 2011, Green Communications and Networking Workshop, pp. 331-306	2011
A. P. Bianzino, L. Chiaraviglio, M. Mellia	*GRiDA: a Green Distributed Algorithm for Backbone Networks*	IEEE Online Green Communications Conference (GreenCom 2011), pp. 113-119	2011
R. Khan, R. Bolla, M. Repetto, R. Bruschi and M. Giribaldi	*Smart Proxying for Reducing Network Energy Consumption*	SCS International Symposium on Performance Evaluation of Computer and Telecommunication Systems (SPECTS 2012), pp. 1-8.	2012
A. Carrega, S. Singh, R. Bruschi, R. Bolla	*Traffic Merging for Energy-Efficient Datacenter Networks*	SCS (IEEE) International Symposium on Performance Evaluation of Computer and Telecommunication Systems (SPECTS 2012), pp. 1-5.	2012

Authors	Title of the publication	Proceedings of	Year
R. Bolla, R. Bruschi, F. Davoli	*A Steady-State Model for Energy-Efficient Packet Processing Engines Under Mixed Traffic*	Fourth International Conference on Communications and Electronics (ICCE 2012), Special Session on Energy-Efficient Networking, pp. 251-256.	2012
P. Arabas, K. Malinowski, A. Sikora,	*On Formulation of a Network Energy Saving Optimization Problem*	Fourth International Conference on Communications and Electronics (ICCE 2012), Special Session on Energy-Efficient Networking, pp. 227-232.	2012
E.Niewiadomska-Szynkiewicz, A. Sikora, P. Arabas, J. Kolodziej	*Control Framework for High Performance Energy Aware Backbone Network*	European Conference on Modelling and Simulation (ECMS 2012)	2012
V. Riccobene, A. Lombardo, D. Reforgiato, G. Schembra	*Modeling Temperature and Dissipation Behavior of an Open Multi-Frequency Green Router*	GTTI (Italian Association of Telecommunications and Information Technologies Group) 2012, Proc. on line	2012
A. Lombardo, D. Reforgiato, V. Riccobene, G. Schembra	*Modeling Temperature and Dissipation Behavior of an Open Multi-Frequency Green Router*	IEEE Online Green Communication Conference (GreenCom 2012)	2012
D. Reforgiato, A. Lombardo, F. Davoli, L. Fialho, M. Collier, P. Donadio, R. Bolla, R. Bruschi	*Exporting Data-Plane Energy-Aware Capabilities from Network Devices toward the Control Plane: The Green Abstraction Layer*	17th European Conf. on Network and Optical Communications (NOC 2012), pp. 1-6.	2012
A. Lombardo, C. Panarello, D. Reforgiato, G. Schembra	*Power Control and Management in the NetFPGA Gigabit Router*	Future Network & Mobile Summit	2012

Authors	Title of the publication	Proceedings of	Year
A. Carrega, S. Singh, R. Bolla, R. Bruschi	*Applying Traffic Merging to Datacenter Networks*	e-Energy 2012, ACM	2012
A. Cianfrani, V. Eramo, M. Listanti, M. Polverini	*Introducing Routing Standby in Network Nodes to Improve Energy Savings Techniques*	e-Energy 2012, ACM	2012
R. Bolla, R. Bruschi, C. Lombardo	*Dynamic Voltage and Frequency Scaling in Parallel Network Processors*	13th IEEE Conf. on High Performance Switching and Routing (HPSR 2012), pp. 242-249.	2012
A. P. Bianzino, L. Chiaraviglio, M. Mellia	*Distributed Algorithms for Green IP Networks*	IEEE INFOCOM'12, Workshop on Communications and Control for Sustainable Energy Systems: Green Networking and Smart Grids, pp. 121-126.	2012
R. Bolla, R. Bruschi, F. Davoli, L. Di Gregorio, L. Giacomello, C. Lombardo, G. Parladori, N. Strugo, A. Zafeiropoulos	*The low Energy COnsumption NETworks (ECONET) Project*	Second IFIP Conference on Sustainable Internet and ICT for Sustainability (SustainIT 2012)	2012
R. Bolla, R. Bruschi, P. Donadio, G. Parladori	*Energy Efficiency in Optical Networks*	15th IFIP/IEEE Internat. Telecom. Network Strategy and Planning Symp. (NETWORKS'12)	2012
F. Guo, O. Ormond, M. Collier, X. Wang	*Power Measurement of NetFPGA Based Router*	Greencomm 2012, IEEE, 26-28 Sept 2012	2012
P. Arabas, K. Malinowski, A. Sikora	*On formulation of a network energy saving optimization problem*	4th International Conference on Communications and Electronics ICCE2012, IEEE	2012

2.5. Conferences and symposia

Possible influence of power saving technologies and ideas of the ECONET project have already been presented and discussed in national and international conferences. The results of the ECONET project will be submitted for presentation in future conferences in the networking field. The main

attention will be devoted to IEEE and ACM conferences. Other events, including those not foreseen at the moment, may be addressed as well.

2.5.1. Attended conferences and symposia (presentation of contributions, keynotes, invited speeches, panels…)

The partners, beside the participation in all the conferences shown in Table 2 (to present the corresponding published contributions), have done also the following additional presentations reported in Table 3.

Table 3: Attended conferences.

Acronym	Conference and title of presentation	Date	Location
ATNAC 2010	**Australasian Telecommunication Networks and Applications Conference.** *Invited keynote* *Energy Efficiency in the Future Internet: Current Status and Trends* F. Davoli (CNIT)	Nov., 2010	Auckland, New Zealand
VTC2011	**IEEE 73rd Vehicular Technology Conference** **Workshop on Cognitive radio and Cooperative strategies for POWER saving (C2POWER)** *Invited panellist* *Energy Efficiency in Future Telecommunications: Technical Issues, Standardization Activities and Business Requirements* R. Bolla (CNIT)	May, 2011	Budapest, Hungary
IEEE GreenCom 2011	**1st IEEE Online Green Communication Conference (GreenCom 2011)** *Invited Keynote* *Enabling Fixed Network Energy Efficiency Optimization Through Dynamic Adaptation-Research Challenges and European Project Efforts.* R. Bolla (CNIT)	Sept, 2011	Online

Acronym	Conference and title of presentation	Date	Location
FOTONICA2011	**13th Italian National Conference of Photonic Technologies.** *Invited Speech* *ECONET's overview and goals* R. Bolla (CNIT) Notes: ECONET participated with its stand including poster and leaflets. During the Conference a meeting was held with the project Geysers, for info exchanges and possible collaborations	May, 2011	Genoa, Italy
IEEE C2POWER	**IEEE 73rd Vehicular Technology Conference -Workshop on Cognitive radio and Cooperative Strategies for POWER saving** *Invited panel* *Energy Efficiency in Future Telecommunications: Technical Issues, Standardization Activities and Business Requirements* R. Bolla (CNIT)	May, 2011	Budapest, Hungary
WoWMoM	**First International Workshop on Sustainable Internet and Internet for Sustainability (SustaInet 2011)** co-located with WoWMoM 2011 *Invited keynote* *Green Networking Technologies for a Sustainable Future Internet* F. Davoli (CNIT)	20 June, 2011	Lucca, Italy
HOTI 2011	**IEEE 19th Annual Symposium on High-Performance Interconnects** *Invited speech* *Paving the Road to Exascale* E. Zahavi (MLX)	August, 2011	Santa Clara, USA

Acronym	Conference and title of presentation	Date	Location
CCW 2011	**25 th IEEE Annual Computer Communications Workshop** ***Invited panel*** *Energy Efficient Networking: The Views of Leaders of International Research Projects. Energy Efficient Networking:The ECONET Project (low Energy COnsumpiton NETworks)* F. Davoli (CNIT)	October, 2011	Hyannis, Cape Cod. MA, Usa
IEEE INFOCOM 2012	**The 31st Annual IEEE International Conference on Computer Communications (INFOCOM 2012)** ***Invited panel on "Green Communication and Computing"*** *Energy-Efficiency in Next Generation Wire-line Networks* R. Bruschi (CNIT)	March, 2012	Orlando, USA
NOC 2012	**17th European Conf. on Network and Optical Communications** ***Invited paper*** *Exporting Data-Plane Energy-Aware Capabilities from Network Devices toward the Control Plane:* *The Green Abstraction Layer* D. Reforgiato, A. Lombardo (LGT), L. Fialho, M. Collier (DCU), P. Donadio (ALU), R. Bolla, R. Bruschi, F. Davoli (CNIT)	June, 2012	Vilanova i la Geltrú, Spain
NGI 2012	**Eighth Euro-NF Conference on Next Generation Internet NGI 2012** ***Invited keynote*** *Energy Efficiency in the Present and Future Internet: An Evolutionary Approach* F. Davoli (CNIT)	June, 2012	Karlskrona, Sweden

Acronym	Conference and title of presentation	Date	Location
Future Network & Mobile Summit	**Future Network & Mobile Summit 2012** **Workshop on Green Communications and Networks** *Invited talk* *A Smart Proxy Architecture for Power Consumption Reduction in the Home Environment* R. Bruschi (CNIT) **Workshop on Fostering Programmability of Wireless Networks** *Invited talk* *ECONET – Network Programmability for Green Networking* R. Bruschi (CNIT) **Session 8d: Scalable Architectures for the Real World Internet** *Presentation* *Power Control and Management in the NetFPGA Gigabit Router* D. Reforgiato (LGT)	4-6 July, 2012	Berlin, Germany
IFIP WG 7.6	**The 12th Conference of the IFIP Working Group 7.6 "Advanced Analytics"** *Presentation* *Joint routing and bandwidth allocation strategies in energy aware networks* P. Jaskóła (NASK)	29-31 August, 2012	Aachen, Germany
KSTiT	**Polish National Telecommunication Symposium** *Invited speech* *Econet – Energy Efficient Technologies for Wire Networks* M. Kamola (NASK)	September, 2012	Miedzeszyn, Poland

Acronym	Conference and title of presentation	Date	Location
INFOS	**XV Joint International Scientific Event on Informatics** *Invited speech* *Energy-Efficient protocol in OMNET++ Simulation Environment* K. Daniluk (WUT)	September, 2012	Rzeszów, Poland
ITU-T GSW	**ITU-T Green Standards Week** *Poster exhibition* *ECONET project* R. Bolla (CNIT)	September, 2012	Paris, France

Finally, it should be highlighted that the estimated energy saving in 2015-2020 perspective telecommunication networks by the ECONET project have been referred to in the presentation of Mr. Flavio Cucchietti "Overview of the ITU Report on "Boosting Smart Grids Through Energy Efficient ICT" shown during the ITU Symposium on ICTs, the Environment and Climate Change (Montreal, Canada, 29-31 May 2012)

http://www.itu.int/ITU-T/worksem/climatechange/201205/programme.html

2.5.2. Planned conferences and symposia

The planned conferences being targeted are shown in Table 4. Notice that, as conferences are only announced a few months before the actual event, this list will likely have to be extended in the subsequent versions of this document.

Table 4: Planned conferences.

Acronym	Conference	Date	Location
IEEE GLOBECOM	**IEEE Global Communication Conference** *Presentation* *Designing Optimal Energy Profiles for Network Hardware* R. Bolla, R. Bruschi, F. Davoli (CNIT)	3-7 December, 2012	Anaheim, USA
ACM CoNEXT	**International Conference on emerging Networking EXperiments and Technologies**	10-13 December, 2012	Nice, France
IEEE INFOCOM	**IEEE International Conference on Computer Communications**	14-19 April 2013	Turin, Italy

Acronym	Conference	Date	Location
ECMS	**European Conference on Modelling and Simulation**	27-30 May, 2013	Alesund, Norway
IEEE ICC	**IEEE International Conference on Communications**	9-13 June, 2013	Budapest, Hungary
EU	**Future Network & Mobile Summit**	3-4, July	Lisbon, Portugal
INTELEC	**35th International Telecommunications Energy Conference**	13-18 October, 2013	Hamburg, Germany

2.6. Workshops and exhibitions

2.6.1. Attended workshops and exhibitions

The partners have already organized and participated in workshops shown in Table 5.

Table 5: Attended workshops.

Workshop	Date	Location
3rd Int. Workshop on Green Communications *Presentation* *An Analytical Model for Designing and Controlling New-Generation Green Devices* R. Bolla, R. Bruschi, A. Carrega, F. Davoli (CNIT) Note: **Winner of the Best Paper Award**	10 December 2010	Miami, FL, USA
4th Future Internet Cluster Workshop on ICT and Sustainability *Presentation* *ECOnet: Low Energy Consumption Networks* R. Bolla (CNIT)	May 2011	Budapest, Hungary
GTTI 2011 *Presentation* *A Flexible Router for On-fly Dynamic Packet Management in NetFPGA Platform* A. Lombardo, C. Panarello, D. Reforgiato, E. Santagati, G. Schembra (LGT)	June, 2011	Messina, Italy

Workshop	Date	Location
IEEE NZ Wireless Workshop *Presentation* *Green Networking in Wired and Wireless Networks – Bridging the Gap* F. Davoli (CNIT)	26 August, 2011	Christchurch, New Zealand
ITU Green Standards Week **ITU Green Standards Week - Workshop on "Moving to a green Economy through ICT standards"** *Invited speech* *ECONET: low Energy COnsumption NETworks* R. Bolla (CNIT) Notes: ITU event hosted by Telecom Italia. The main purpose of the event was to raise awareness of the importance and opportunities of using ICT standards to build a green economy. The body of the talks comprised three workshops: • *Methodologies for Environmental Impact Assessment of ICT*, jointly organized with the European Commission and hosted by TELIT, • *Moving to a Green Economy through ICT Standards*, jointly organized with Telecom Italia, • *Submarine Cables for Ocean/Climate Monitoring and Disaster Warning: Science, Engineering, Business and Law* was organized with WMO and UNESCO. A general presentation of the ECONET project was provided. The program of the event, including presentations and record of the webcast can be found at the following link: http://www.itu.int/ITU-T/climatechange/gsw/201102/index.html	5-9 September, 2011	Rome, Italy
Half day common workshop with EU projects: EARTH, C2POWER and TREND	October, 2011	Italy

Workshop	Date	Location
GN3 Green networking: advances in environmental policy and practice ***Presentations*** *Towards energy efficient Internet Service Providers - ECOnet perspective* C.Vassilakis (GRNET) *Baseline studies of an NREN and the whole GÉANT network* A. Zafeiropoulos (GRNET)	5-6 March 2012	Utrecht, The Netherlands
1st ETSI workshop on Energy Efficiency ***Presentation*** *Energy COnsumption NETworks (ECONET): Smart power management for fixed network devices* M. Enrico (TEI) ***Session chaired*** *EE Research Projects* R. Bolla (CNIT) Notes: Workshop supported by ECONET (including technical committee participation, session chairing and final panel participation).	21-22 June, 2012	Genoa, Italy
GTTI 2012 ***Panel*** *Modeling temperature and dissipation behaviour of an open multi-frequency green router* G. Schembra (LGT)	June, 2012	Villasimius, Sardinia, Italy
e-FISCAL Summer Workshop co-located with the Samos Summit on Open Data and Interoperability ***Presentation*** *GRNET Cloud Center economics and Green IT case studies* A. Zafeiropoulos (GRNET)	3 July 2012	Samos, Greece

The results of the ECONET project have already been presented on exhibitions co-located with conferences and workshops (see Table 6).

Table 6: Attended exhibitions.

Exhibition	Date	Location
Presentation of UE projects co-located with the Polish National Telecommunication Symposium (KSTiT) *Presentation* *ECONET project* M. Kamola, P. Arabas and M. Mincer (NASK) Notes: The focus was on the results of WP5 work package. The exhibition stand of the ECONET project is presented in Figure 2.	12-14 September, 2012	Miedzeszyn, Poland
The 6th International Warsaw Invention Show (IWIS 2012) *Presentation* *ECONET project* E. Niewiadomska-Szynkiewicz *et al*. (WUT)	16-19 October, 2012	Warsaw, Poland

Figure 2: ECONET exhibition stand.

2.7. Seminars and presentations

In order to enable regular information about the ECONET project results, the partners of the consortium have already organized several academic and technical seminars for researchers, students and industry experts in the field. We plan to organize such meetings during the project lifetime. Moreover, the partners have already participated and plan to participate in various meetings, round table discussions and other dissemination events concerned with the activity in green networking. Particular attention has been and will be paid to create awareness on the low energy consumption and energy efficient methods and technologies developed in the project for wider audience.

2.7.1. Attended seminars and dissemination events

The ECONET project was presented at the meetings and dissemination events collected in Table 7.

Table 7: Attended dissemination events and meetings.

Meeting or Dissemination event	Date	Location
Xilinx Research Day *Poster and flyers* *ECONET activities* M. Collier (DCU)	January 2011	Dublin, Ireland
Green Networking and correlated activities *Presentation* *ECONET cross presentations and possible cooperation with COST804* R. Bolla, F. Davoli (CNIT)	26 January 2011	University of Würzburg, Germany
Economic Forum: Telecommunications, Internet, Media, Electronics *Presentation* *ECONET project* M. Kamola (NASK) Notes: Organized by the Polish Chamber of Commerce for Electronics and Telecommunications	16 May 2011	Rzeszów, Poland

Meeting or Dissemination event	Date	Location
Meeting with Oman Ministry of Education *Presentation* *ECONET project* M. Kamola (NASK)	19 September 2011	Warsaw University, Poland
Future Networks 8th FP7 Concertation meeting **Green Networks Cross Cluster meeting** *Presentations* *Energy Consumption in Fixed Telco's Networks: Status, Trends, Needs and Opportunities* A. Zafeiropoulos (GRNET) *A Pragmatic Approach in Developing New Generation Sustainable Networks* M. Enrico (TEI) *Panel* R. Bolla (CNIT)	6-7 October 2011	Brussels, Belgium
STRONGEST Project Meeting *Presentation* *Presentation of the ECONET Project* R. Bruschi (CNIT)	October 2011	Pisa, Italy
The Rince Institute Research Day *Presentation* M. Collier (DCU) Notes: Presentation to DCU researchers of the ECONET project.	October 2011	Dublin, Ireland
Home Gateway Initiative (HGI) meeting *Presentation* *HGI Energy Phase 2 and ECONET Project. Possible Synergies* L. Giacomello (TELIT), O. Wachendorf (LQDE) Notes: Dissemination of ECONET objectives and state of the art (with specific reference to NT and home gateway activities).	11 November 2011	Dubrovnik, Croatia

Meeting or Dissemination event	Date	Location
Green Touch Meeting *Presentation* *ECONET project* F. Davoli (CNIT) Notes: Online presentation of the ECONET project to the Core Optical Network and Transmission (CONT) Working Group of the Green Touch Consortium	November 2011	Seattle, WA, USA (online)
Green ICT in Italy: Networks, Cloud and Power Grid *Presentation* *Presentation of the ECONET project* F. Davoli (CNIT)	December 2011	Milan, Italy
Meeting of the COST Action IC0804 **(Energy Efficiency in Large Scale Distributed Systems)** **Round table discussion on** **"Metrics for End-to-End Energy Efficiency"** *Presentation* *Connection-wise Energy Efficiency: Measuring Power Consumption of TCP and of Nodes along the Path* F. Davoli (CNIT)	8 May 2012	Madrid, Spain
Industry Forum of the IEEE International Conference on Communications (ICC'12) *Panel* *Future Home Gateway Services for Next Generation Home Network* L. Di Gregorio (LQDE)	12 June 2012	Ottawa, Canada
Home Gateway Initiative (HGI) meeting *Presentation* *Requirements for Network Connections Proxy Functionalities in the HG* L. Giacomello, M. Quacchia (TELIT), O. Wachendorf (LQDE), M. Giribaldi (INFO) Notes: Dissemination of ECONET architectural model and requirements on connectivity proxy.	12 June 2012	Paris, France

Meeting or Dissemination event	Date	Location
ETNO (European Telecommunications Network Operators) meeting ***Invited speech*** *Research Activities at the TNT LAB: the Project ECONET* R. Bolla (CNIT)	18 June 2012	Genoa, Italy
Home Gateway Initiative (HGI) meeting Dissemination of ECONET architectural model and requirements on connectivity proxy, integrated with other HGI contributions *HN Device Energy Management Architecture and Data Model Proposal* L. Giacomello, M. Quacchia (TELIT) Notes: Dissemination of ECONET architectural model and requirements on connectivity proxy, integrated with other HGI contributions. In cooperation with the ECONHOME consortium and Orange.	13 September 2012	Heidelberg, Germany

The ECONET project was presented to different DCU and CNIT visitors and contacts including:

- CNIT: Mr. Olivier Lauvray: President & Managing Director of NetLogic Microsystems Europe;

- CNIT: Mr Shugong Xu, Pricipal Scientist and Vice –Director of Comm. Lab, Senior researcher Mr. Zhu Bin, from HUAWEI TECHNOLOGIES Co.;

- DCU: Mr. Zhaotian Zhang: Deputy Director General of the National Natural Science Foundation of China, in charge of the ICT division (very important figure for research funding in China); 1

- DCU: Prof. Yinghai Zhang: Vice President of BUPT (Beijing University of Posts and Telecommunications), and a number of research active professors from BUPT including Prof. Wenbo Wang (Director for postgraduate studies in BUPT);

- DCU: Mr. Jichun Feng (former director general of the High-Technology Research & Development Centre in The Ministry of Science & Technology, China);

- Other DCU visitors including from Wuhan University, Beijing Institute of Technology, Xian Jiaotong University, ETM: European Telecommunications Management Ltd, and Indian Institute of Science Bangalore.

Prof. Suresh Singh and his PhD student Ms Candy Yiu visited the TNT Lab at the University of Genoa, Italy, in November 2011 within the framework of the external participation of Portland State University (PSU), OR, USA, in ECONET activities (see table 8). Within the same framework, Mr Alessandro Carrega, PhD student at the University of Genoa, strongly involved in ECONET activities, spent 6 months at PSU, between October 2011 and April 2012.

Prof. Franco Davoli was appointed Visiting Erskine Fellow at the University of Canterbury, Christchurch, New Zealand, where he spent two months in the period July-September 2011, teaching a course in "Green Networking" and giving a few talks and seminars on the same subject (see Tables 8 and 9 below).

Some contacts have been created by Telecom Italia with the project ECONHOME that has been finalized in a common remote meeting realized in April 2012, where possible common contribution to the standardization forum in the area of the NCP have been discussed.

The partners of the ECONET consortium have organized seminars on the green networking and ECONET project goal and idea. The titles of talks given by the partners of the consortium are listed in Table 8.

Table 8: Organized seminars and talks.

Seminar or Talk	Date	Location
Seminar *ECONET: low Energy Consumption NETwork – project presentation* E. Niewiadomska-Szynkiewicz (WUT)	November 17, 2010	Warsaw University of Technology, Poland
Seminar *ECONET the 7th FP project – project objectives* M. Kamola (NASK)	November 24, 2010	NASK, Poland
Seminar *Energy efficiency in the future Internet: current status and trends* R. Bolla, R. Bruschi (CNIT)	March, 2011	Scuola Superiore Sant'Anna, Pisa, Italy
Invited speech *Green Networking Technologies for a sustainable future internet* F. Davoli (CNIT)	August 8, 2011	University of Canterbury, Christchurch, New Zealand
Seminar *Green Future Internet and green energy: a profitable liaison* F. Davoli (CNIT)	August 24, 2011	Auckland University of Technology, Auckland, New Zealand
IEEE NZ ComSoc *Invited talk* *Green Future Internet and green energy: a profitable liaison* F. Davoli (CNIT)	August 25, 2011	Christchurch, New Zealand

Seminars and talks	Date	Location
Seminar *Merging Traffic to Save Energy in the Enterprise* S. Singh (University of Portland, UPC)	November 11, 2011	University of Genoa, DIST
Seminar *Green networking: the frontier of the Internet and telecommunications beyond the crisis* R. Bruschi (CNIT)	May 10, 2012	University of Catania, Italy

The ECONET working progress was presented by Telecom Italia during the ITU-T Joint Coordination Activity on ICT and climate change (JCA-ICT&CC), which was held in Geneva on the 11th of October 2012. The objectives of the Joint Coordination Activity on ICT and climate change (JCA-ICT&CC) are to co-ordinate activity on ICT & CC across ITU-T Study Groups, in particular SGs (5, 9, 13, 15 and 16), and to coordinate with ITU-R and ITU-D, as well as to provide a visible contact point for ICT and Climate Change activities in ITU-T, to seek co-operation from external bodies working in the field of ICT & CC and enable effective two-way communication with these bodies.

2.8. Planned workshops, exhibitions, seminars and dissemination events

The ECONET consortium envisaged organizing at least two Workshops/Sessions when project results will be ready to be disseminated. The target audience will consist of stakeholders from government and businesses, technical experts, researchers, network operator organizations (e.g., GeSI, etc.) and industrial forums (e.g., HGI, etc.).

Currently, the plan is a bit more ambitious. For what concerns the organization of events we foresee four potential initiatives:

- With respect to the Future Internet and Mobile Summit 2013, there is a preliminary agreement with the Project TREND for co-organizing a specific Workshop on the energy efficiency themes (the precise title is still under discussion).

- CNIT (R. Bolla and F. Davoli) will be strongly directly involved in the organization of the next **22nd ITC Specialist Seminar, which** will be on **Energy Efficient and Green Networking (SSEEGN 2013)**. The objective here is to have a session dedicated to the ECONET project results.

- The same objective is in charge for the **2013 Tyrrhenian Workshop on Digital Communications (TIWDC 2013)**, which will be organized by F. Davoli and R. Bolla on Green ICT and the telecommunication network energy efficiency themes. Also in this case, there is a plan of having a specific session dedicated to the ECONET project results.

- In the already cited preliminary contacts we had with the **International Energy Agency - IEA)**, the proposal emerged of participating with a specific session or, anyway, with a dedicated time space for the ECONET project in an International Event that they plan to organize for the end of the year. The specific interest in this case is related to the typology of attendees of this kind of event that should be mainly characterized by private and public policy makers.

Moreover, due to the availability of the first experimental demos at the end of the second year, we are planning to participate in some exhibitions for showing, with practical and tangible examples, the effectiveness and the importance of the ECONET results. We have already defined two potential demo submissions:

1) two demo proposals to be presented at INFOCOM 2013 (one covering the access part, the other covering the transport/core);

2) a global demo for the ECONET project at the Future Internet and Mobile Summit 2013.

Possible additional objectives for presenting the final results in terms of oral descriptions, posters and demonstrations will be decided in the fifth general meeting of the project.

2.9. Academic and training courses and tutorials

Although in the last years the sustainability and the green approach to technologies became a critical issue in many research fields, the majority of engineers, researchers and students have only scattered information and superficial knowledge about the energy efficiency technologies related to the networking field. We plan to survey among partners to assess and identify training needs. Based on this survey a training program will be elaborated with the planning of the required workshops and training courses, making use of both partners' or external resources.

Academic partners have the responsibility to prepare and deliver lectures on green networking and include ECONET outcomes in their institutional courses and other educational activities. Furthermore, M.Sc. and Ph.D. theses and other research works on the subject are being proposed.

The following courses provided and planned in Warsaw University of Technology include materials related to ECONET:

- Modelling and Computer Simulation

- Computer Networks

- Distributed Systems

Moreover, the ECONET partners have already prepared and submitted tutorials about technologies for green networking. Several tutorials have already been held (see Table 9).

Table 9: Delivered lectures and tutorials.

Lectures or Tutorial	Date	Location
Course on "Architectures and Applications for TLC Networks" in the Telecommunications Engineering Curriculum at the University of Genoa *Lectures* *Green Networking* F. Davoli, R. Bruschi (CNIT)	May, 2012	University of Genoa, Italy

Lectures or Tutorial	Date	Location
Course "COSC473: Relational Methods" **at the University of Canterbury** *Lectures* *Green Networking* F. Davoli (CNIT) Notes: Eighteen hours of lectures delivered by Prof. Davoli as Visiting Erskine Fellow.	July-Aug. 2011	University of Canterbury, Christchurch, New Zealand
The 12th IEEE International Conference on High Performance Switching and Routing (HPSR 2011) *Tutorial* *Green Technologies for Smarter Next-Generation Wire-line Networks* R. Bruschi (CNIT)	July 3, 2011	Cartagena, Spain
ICE ERASMUS MUNDUS PhD Program *Lectures* *Green Networking* R. Bolla (CNIT)	July 16-20, 2012	University of Genoa, Italy
2012 International Symposium on Performance Evaluation of Computer and Telecommunication Systems (SPECTS) *Tutorial* *Green Technologies for Smarter Next-Generation Wire-line Networks* R. Bruschi (CNIT)	11 July, 2012	Genoa, Italy
The 4th International Conference on Communications and Electronics (ICCE 2012) *Tutorial* *Green Networking: A Tutorial* F. Davoli (CNIT)	2 August, 2012	Hue, Vietnam

Some of the ECONET partners plan to fund, or even are already paying, doctoral grants for Ph.D. students to let them work within research areas of interest for the project.

2.10. Contacts with potential users

In the course of their business contacts the ECONET participants are familiarizing their partners with their concepts and emerging technologies. Telecommunication companies and institutions have already been and will be contacted and exposed to the ideas and results of the project.

Moreover, beside the fact that some ECONET partners are end-user operators that can be also potential users of the project outcomes, in many of the contexts in which the activities and the results of the project have been presented most of the attendees were potential users of the ECONET results. Examples are the ETNO (European Telecommunications Network Operators)

meeting Group ECONET presentation and discussion, the presentations and the stands at the ITU-T Green Weeks (2011 and 2012) and most of the presentations done in the standardization area. In this last respect the ETSI Workshop on Energy Efficiency, which took place on the 20th-21st of June 2012, in Genoa (see D7.6 for details) supported by ECONET, is a very effective and important case (we receive feedback and strong expressions of interest from many of the participant Telecoms and ISPs).

3. Conclusions

The dissemination and promotional activities should follow the ECONET communication strategy and implement actions maximizing the exploitation of project results. The goal of the ECONET project should be presented to the wider community and novel standards for green networking should be promoted. Therefore, current and future work in dissemination will aim to achieve the following tasks:

- to verify the interest toward green networking through workshops, seminars and meetings with potential users,

- to convey knowledge about ECONET,

- to cooperate with other research groups and RTD initiatives,

- to initiate the cooperation with key customers,

- to continue the cooperation with standardisation bodies,

- to prepare plans for the optimal use of the project results.